Prioritized Technology: High-Temperature Compatible Power Systems
Low-Intensity High-Temperature Solar Cells

Capability Description

- Solar cells that can operate at temperatures above 450 C and 90 bar and can work with low intensity illumination.
- In addition, for some destinations the solar cells must be chemically resistant to harsh environments.

Capability Status

- Low Intensity High Temperature (LIHT)solar cells do not exist beyond the laboratory concepts.
- Current technologies have not been tested beyond 400 C.
- New technology using high bandgap semiconductors has some promise for reaching the goal of operation at 450 C.
    - The TRL for this technology for solar cells is currently TRL 1 or TRL 2 at best.

Mission Applications

- Venus surface power for mid-term and far term missions.
    - These types of missions will be longer duration and will require a power source to recharge the batteries.
- For applications higher in the atmosphere, the temperatures will be somewhat less extreme and more illumination will be available, but the harsh chemical environment will still be present.
- Existing solar technology might work on mountain tops.

Development Cost and Schedule